

broadcast standard to be capable of cable carriage, the development of such a standard should proceed in conjunction with work on the cable HDTV ("C-HDTV") standard described below.

The Commission's experience with AM stereo supports this view. Broadcast HDTV systems are in a much earlier stage of development than was AM stereo at the time the Commission declined to adopt a single system or impose standards for that medium.<sup>26</sup> In AM stereo, there were five clearly developed, functional systems under consideration, and the Commission declined to select from among them. Although the Commission's refusal to select an AM stereo system has been blamed for the failure of AM stereo to achieve nationwide acceptance, the full responsibility cannot be placed at the Commission's doorstep. Other reasons clearly unrelated to multiple standards also have played a significant role.

In February, 1987, the National Telecommunications and Information Administration ("NTIA") published a report regarding "AM Stereo And The Future of AM Radio" ("NTIA Report"). Although NTIA's survey of AM radio stations indicated that "a major reason why stations decline to purchase stereo is the presence in the market of two incompatible transmission systems," other reasons were present as well.<sup>27</sup> For example, many stations cited their

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<sup>26</sup> AM Stereophonic Broadcasting, 51 RR 2d 1 (1982).

<sup>27</sup> NTIA Report at 13.

inability to afford stereo transmission systems, the maintenance and engineering costs associated with the systems, the fact that their stations' programming formats were not suited for stereo transmissions and the belief that stereo transmission is not important to AM radio.<sup>28</sup>

Even if the Commission is inclined to suspect that its decision not to specify an AM stereo standard was ill-advised (a position Time Inc. does not hold), it should not let its concern with the AM stereo situation compel a rush to a premature, and perhaps mistaken selection of a single technology or set of standards for broadcast HDTV. The fact remains that AM stereo technology was much better defined in 1982 (when the Commission declined to adopt a standard) than is HDTV technology today.

The Commission generally has held fast to the policy established in the AM stereo proceedings -- that the marketplace should develop the technical standards for new electronic transmission systems. In 1984, the Commission declined to adopt a single standard for multi-channel television sound presented to it by the Electronics Industry Association. Instead, the Commission chose an approach "which does not impede the opportunity for marketplace advances in technology."<sup>29</sup> Just last year, the Commission removed from its rules technical

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<sup>28</sup> Id. at 11.

<sup>29</sup> Television SCA Use, 55 RR 2d at 1645.

specifications for FM stereo transmissions, concluding that such specifications "limit marketplace research and development of new technology."<sup>30</sup> In the area of satellite scrambling, the Commission likewise deferred to the marketplace for technical standards setting and system selection.<sup>31</sup>

Thus, it appears that the Commission's policies of permitting technical standards to be developed and selected in an unregulated marketplace generally have been successful. Even if the Commission were to conclude, however, that standards setting in certain areas would be beneficial, HDTV would not be a logical candidate at this time. The technology is too new and developments are occurring too rapidly for a single system or set of standards to be proper now or in the foreseeable future. However, if at some point the broadcast industry agrees on a standard and wants the FCC to mandate a broadcast standard, we

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<sup>30</sup> FM Technical Rules, 60 RR 2d 374, 376 (1986).

<sup>31</sup> Report, 2 FCC Rcd. 1669 (1987). The satellite scrambling situation is proof that the marketplace can select a technical standard in a highly efficient manner. In its initial Report on scrambling, id., the Commission concluded that the marketplace had selected the Video Cipher II ("VC II") scrambling system as the de facto standard for distribution to consumers. In its most recent quarterly report on scrambling issues, the Commission reported that 33 program channels are scrambled via VC II, five are planning to use VC II and three others are inclined in that direction. No other standard was reported under consideration by United States cable programmers. Second Three-Month Progress Report on the Home Satellite Dish Programming Market (September 1987).

would not oppose such a development, assuming that it met the requirements of low cost and high quality cable distribution without interference to other services.

The standards issue is not merely a technical question. It is, of course, the key determinant of the quality a distribution medium can deliver to consumers. The ability to provide the highest quality HDTV possible is of critical importance to the cable industry. Today, the cable industry faces increasing competition from video cassettes. By Christmas, video stores will be able to provide consumers with cassettes in an enhanced, "super VHS," format. HDTV VCRs will be available by 1990. Once HDTV video recorders and television sets become available, consumers will be able to view video product in their homes, complete with wide screen aspect ratios and film-like color and resolution.<sup>32</sup> The cable industry must be able to respond to this competition by offering cable subscribers comparable HDTV quality. This issue is particularly important for pay cable services such as HBO. By and large, these services rely on major motion pictures and therefore the competition with video cassettes is even more acute.<sup>33</sup> Already, video cassette rental outlets have an important advantage over pay cable services --

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<sup>32</sup> HDTV VCRs clearly will provide the highest quality HDTV because the information on the cassette will not be diminished by the frailties of the distribution system.

<sup>33</sup> Cable sports services (e.g., ESPN and regional sports channels) and music services (such as MTV) likewise should find HDTV to be a significant enhancement to their program offerings.

they can provide consumers with motion pictures on television prior to the time HBO is permitted to display these works on its services. Pay services should not suffer an additional disadvantage in the form of artificial constraints on their picture quality.

In order for cable to realize its potential as a distributor of very high quality HDTV, however, it must have access to a transmission system that has been optimized for the cable environment ("C-HDTV"). Such a stand-alone system would ideally have the following characteristics:

- a. Provide 1000 lines of horizontal and vertical resolution in both static and moving images

The C-HDTV format should be designed and implemented so as not to limit the quality of the HDTV signal the cable subscriber will receive. The objective should be to provide a signal that is at least as good as the consumer can originate in his home via a VCR. Initially, vertical and horizontal resolution of 1000 lines is necessary to reach this quality level. Evolution to further improved HDTV systems should be accommodated.

- b. Have a high degree of immunity to the types of noise and distortion which characterize a cable transmission system

Cable systems, with their long cascades of amplifiers, are necessarily subject to the build-up of noise and intermodulation products. HDTV signals, with their more precise picture information, may be more prone than NTSC signals to objectional degradation from these effects. An ideal HDTV transmission system for cable would exhibit immunity from such degradation, and would be consistent with cable channelization plans. Moreover, cable systems are configured around a 6 MHz per channel channelization plan. A C-HDTV system that does not operate in this existing channelization plan could create distortion in the remaining conventional television channels as well as receive degradation from the conventional channels on the system.

- c. Require minimal up-front capital investment

If a C-HDTV format is to be accepted and promoted by the cable industry, it must be designed to minimize the amount of technical modifications to cable systems initially and over time. To the extent possible, any necessary modifications should be done at the cable headend rather than in the distribution plant.

d. Co-exist with NTSC and other C-HDTV channels

The optimum C-HDTV system should not require changes to an existing cable television channelization plan. It should co-exist with that plan, i.e., not burden or require removal of existing NTSC channels. Existing cable signal parameters should be maintained, with free interchangeability between NTSC and C-HDTV channels.

e. Not rely on NTSC as a starting point for development

Time Inc. envisions a C-HDTV system that does not simply augment the existing NTSC channel. Freedom from the NTSC format will provide greater latitude to design an HDTV system that maximizes the quality of the HDTV signal delivered to the consumer. Moreover, a non-NTSC system can be designed to allow evolution to even higher quality HDTV systems with the addition of augmentation information without requiring replacement of the existing base of HDTV receivers.

f. Permit real time program transmission

The C-HDTV system should accommodate the distribution of live HDTV programming. HBO and other cable program services increasingly are offering live events (concerts, sports, etc.). Because some bandwidth compression techniques will not permit live distribution, they are unacceptable for C-HDTV.

g. Interface easily with SMPTE approved  
production standard

As noted previously, the 1125/60 production system is in wide use in North America and has been approved by the SMPTE. It is likely that this format will become the system of choice for HDTV programming, whether originated live, from film or on video tape. Accordingly, the C-HDTV delivery format must be able to interface easily with the 1125/60 production format.

h. Use parameters that permit reasonably priced  
multi-standard NTSC/HDTV television sets to  
be produced

Time Inc. believes that, based on marketplace demand, HDTV receivers will be manufactured so as to be capable of displaying a variety of television formats including NTSC, VCR HDTV, enhancements to NTSC television and C-HDTV. In developing the



C-HDTV format, the industry should bear this capability in mind and conform the C-HDTV format, to the extent possible, to the television set parameters known today.

i. Provide high quality audio channels

Time Inc. believes that a C-HDTV system should provide at least four high quality audio channels. These channels should be capable of changeable configurations as follows: four independent channels; two stereo channels; or one four-channel sound system.

j. Include built-in high security audio/video scrambling

The C-HDTV system should be designed with high video security and very high audio security.

k. Recordable on consumer VCRs and optical disks and on professional VTRs

Professional VTRs should be able to record the C-HDTV format and the C-HDTV format should be recordable on consumer VCRs and optical disks.

1. Recognize various satellite requirements

The C-HDTV format should be deliverable by satellite to cable headends.

A C-HDTV system possessing the characteristics described above will be able to compete with state-of-the-art VCR HDTV systems and provide cable television subscribers with a truly high quality video service. It will maximize the capabilities of the cable distribution medium and enable cable television to reach its full potential as a distributor of high quality video programming.

Neither MUSE nor any of the other systems of which Time Inc. is currently aware meet all of these objectives. Time Inc. has funded exploratory development work by CATS on a system to conform to them, and has interest in working with other parties to modify existing systems, or develop new ones, in this direction. Within the limits of economic and technical practicality, Time Inc. believes these characteristics to be highly important for successful transmission of HDTV on cable systems.

4. Transition Issues

With respect to the transition to an HDTV system, the Commission recognized in paragraph 43 of the Notice that compatibility with NTSC may not be in the public interest:

[W]e now incline towards the view that, in the event we establish improved broadcast television systems, they should be implemented in a manner that allows eventually for the complete replacement of the NTSC, so that the benefits of improved off-air television service may be enjoyed by the Nation's viewers generally.<sup>34</sup>

This does not mean, however, that there will be a sudden, massive transition in which consumers will be forced to abandon NTSC in favor of a higher HDTV standard. The economics of the video industry (including broadcast television, cable television and VCR) will dictate that consumers with existing equipment will be served until they have elected to substitute HDTV receivers on a widespread basis. Thus, television programmers, whether they distribute by broadcast, cable, VCR, satellite or other means, will continue to serve the millions of existing NTSC consumers with some form of compatibility as they implement HDTV service.<sup>35</sup>

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<sup>34</sup> Notice at ¶ 43.

<sup>35</sup> The Commission appears to recognize this fact in the Notice at ¶ 93: "[W]ith the very large population of existing consumer NTSC TV receivers, broadcasters should have a strong incentive to maintain compatibility with those receivers." The same is true of cable television system operators and programmers and video cassette providers.

A number of options exist for dealing with the transition from NTSC to HDTV without rendering obsolete existing television sets. For example, cable operators may provide customers a service in both an NTSC format and an HDTV format. Alternatively, cable operators may provide programming in enhanced NTSC format with no necessity for additional channels. It should be noted that program production in HDTV will occur gradually over many years and, therefore, not every service will need to be delivered in HDTV at the same time and that may minimize any transition difficulties. Given the early stage of HDTV development, it is premature to decide now specifically how the transition will be handled. A variety of alternatives may be appropriate. From Time Inc.'s point of view, two things are certain, however: first, the enormous installed base of NTSC receivers will not be rendered obsolete until the HDTV video industry and display set manufacturers can provide, on a universal basis, affordable alternative HDTV receivers capable of interfacing with alternative distribution standards, and second, we are committed to spending the necessary resources, consistent with consumer demand, to make C-HDTV a reality.

C. Display

At paragraph 97 of the Notice the Commission seeks comments on "the desirability of encouraging compatibility among advanced television systems." While compatibility is desirable, the

promulgation of strict compatibility standards, as the Commission recognizes, could foreclose "benefits that could come about through improvements in technology made subsequent to the establishment of standards."<sup>36</sup> The Commission suggests three ways of achieving compatibility: (1) adopt, as involuntary guidelines, the results of an industry consensus; (2) establish specific compatibility requirements for a short period of time; or (3) protect a key frequency component of the unmodulated baseband.<sup>37</sup>

Compatibility among HDTV systems can be achieved voluntarily and is most likely to occur through the development of television receivers capable of receiving and displaying a variety of transmission formats (VCR-HDTV, C-HDTV, broadcast HDTV, NTSC, MUSE).<sup>38</sup> If television sets are built to accept a multi-standard "family" of signals, and are designed around an open architecture that permits future opportunities for new signals, then mandatory compatibility standards would be unnecessary and unwise.

If HDTV develops as it should, and as outlined in these comments, then a multi-standard television receiver will be the inevitable result. Consumers have available to them today a variety of distribution sources (broadcast, cable, VCR, etc.).

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<sup>36</sup> Id. at ¶ 97.

<sup>37</sup> Id. at ¶ 98.

<sup>38</sup> The Commission recognizes this possibility in the Notice at ¶ 86.

Several HDTV systems will develop if each of these delivery systems is permitted to implement HDTV in such a way as to maximize the capabilities of the particular medium. Once that occurs, consumers will demand, and manufacturers will produce, television sets capable of accommodating all of the distribution systems so that the viewers can assemble and alter freely their HDTV architecture depending on the type of program and delivery system desired. The basic design research for such an HDTV cable compatible system is already underway through work at MIT and in other research projects. Our goal is to make the results of this cable HDTV system available to manufacturers. Based on preliminary discussions with manufacturers, we believe the development of a multi-standard television is achievable. Time Inc. is committed to work with manufacturers to ensure that these multi-standard television sets are developed and made available to consumers.

IV. Manufacturing: HDTV Receivers Should Be Developed to Accommodate a "Family" of HDTV Standards in an Efficient Manner Which Avoids Duplication

There are at least two methods for ensuring that HDTV sets are compatible with several HDTV distribution formats: (1) a separate converter (decoder) could be installed in the set for every HDTV format or input; or (2) the capabilities of a base line video signal processor could be incorporated so as to be

able to process a family of HDTV transmission standards. Time Inc. submits that research and development should be concentrated on the implementation of the latter approach. This focus, which is consistent with current philosophy for improving television sets by adding specific consumer requested enhancements, will provide the lowest possible cost television set for the consumer and avoid a potential incompatible duplication of processing circuitry within the television set itself.

As HDTV transmission standards emerge, Time Inc. believes that there will be a "family" of standards, each optimized for its transmission medium. Ideally, both an NTSC compatible wide format, medium resolution standard and a high resolution, non-NTSC-compatible standard will be available for cable transmission. These may be different from standards optimized for VCR, broadcast, and satellite transmission. Time Inc. believes that the marketplace will dictate that display and VCR manufacturers design their products to accept all of these standards as inputs. The digital signal processing which is likely to be necessary for any of the standards should lend itself to accommodation of a variety of them. In the interest of the consumer, such a multi-standard input is greatly preferable to external converters or interfaces for each delivery system.

Today, the vast majority of the cost in making a television set consists of the picture tube, the cabinet and the power supply. The balance is associated with the input terminals for the various video signals -- cable, VCR, over-the-air, satellite -- and the associated processors, which convert the signals into instructions for the television set display. Improvements in picture quality in recent years have come from improvements to the set's signal process circuitry. With more and more digital processing being added to the set, this trend can be expected to continue. As high-definition capability becomes a part of each video distribution medium, each in its own format as described above, the television sets will need to accommodate the various inputs as they do now, bearing in mind the need to maintain the present balance between the cost of signal processing and the remainder of the set.

Time Inc. recognizes the significant challenges faced by the consumer electronics industries as they seek to design cost effective high performance TV receivers, VCRs and disk machines. This challenge is made particularly difficult by the need to serve existing NTSC, enhancements to NTSC, and the new HDTV approaches.



Time Inc. will be ready to assist TV product designers in the United States, the Far East and Europe in considering those aspects of their designs which facilitate delivery of quality pictures and sound over cable.

V. The United States Can Choose From Among a Variety of Improved Television Standards Only if American Companies Commit to Significant Research and Development

As discussed above, Time Inc. believes that a variety of systems should be developed to offer improved television video and audio. However, this scenario can unfold only if firms involved in the television business, including United States companies, without delay commit significant resources to research and development projects in enhanced NTSC and HDTV.

Japanese and European manufacturers are rapidly developing enhanced NTSC and HDTV systems that are designed for their own particular communications needs. United States industries must invest significant resources to participate in the development of systems appropriate to the unique American needs. An extensive, over-the-air grid of broadcast stations and thousands of cable systems, many offering 40 or more channels of programming, are particular to the United States. The systems needed to provide improved television pictures must be developed to accommodate those methods of television distribution.

Within the last decade, and particularly in the last five years, several projects intended to develop improved television video and audio have begun in the United States. As noted above, Time Inc. has been active in this process. In addition, the Commission has formed an HDTV Advisory Committee,<sup>39</sup> the National Association of Broadcasters is establishing a technical center for HDTV research<sup>40</sup> and the Advanced Television Systems Committee and the Association of Maximum Service Telecasters are active in investigating technical and policy questions involving HDTV. Likewise, the National Cable Television Association's engineering committee recently established a subcommittee to investigate compatibility, standards and general engineering questions regarding HDTV.<sup>41</sup> NCTA also has formed an HDTV committee to deal with HDTV policy and technical matters.<sup>42</sup>

However, more needs to be done. To be effective, United States companies must work cooperatively. Each American firm which could be involved in enhanced NTSC and HDTV research has limited resources compared with the enormous investment made by

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<sup>39</sup> See Broadcasting, Oct. 12, 1987, at 37.

<sup>40</sup> See Multichannel News, Oct. 19, 1987, at 12.

<sup>41</sup> See Broadcasting, Oct. 26, 1987, at 74.

<sup>42</sup> See id.

the Japanese companies, including NHK, in developing MUSE. Together, however, television interests in the United States could support a major research effort.<sup>43</sup>

We urge the Commission to support necessary research and development efforts and to foster an environment which allows joint research and development. Finally, we urge the Commission not to prejudice the outcome of this research and development by prematurely establishing standards for enhancements to NTSC or HDTV.

#### VI. Conclusion

Today, American providers of television programming -- broadcasters and the cable industry alike -- stand at a crossroads: will they deliver to the American television viewer the benefits of improved television picture and sound that technology has already developed and promises further to revolutionize? Only research and development commitments by firms involved in the television business, including United States companies, unhampered by premature standard-setting and focused on delivery of enhancements to NTSC and HDTV which are optimized for each medium will provide these benefits to television consumers in the United States.

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<sup>43</sup> Collaborative research and development efforts are encouraged by federal legislation modifying the antitrust laws. 15 U.S.C.A. §§4301-4305 (West 1984) (the National Cooperative Research Act of 1984).

Time Inc. supports the efforts of broadcasters to develop enhancements to NTSC which are compatible both with existing television sets and cable delivery without loss of quality or significant costs. Time Inc. is committed to continue to work with broadcasters to develop such a system. Provided that such a system met those requirements and worked within the cable industry's current 6 MHz channelization plan, we would support broadcasters' efforts for an FCC-mandated standard once one achieved industry consensus.

Further, Time Inc. urges the Commission to foster an environment in which research and development on HDTV system can proceed and respond to marketplace demands. The cable industry, facing increased competition from various distribution media, including the videocassette industry, has begun research to develop a high quality, cable-optimized HDTV system whose objectives are detailed in this filing. The benefits to the millions of American television viewers who would receive this source of improved television delivery are clear. This HDTV system is not planned simply to augment NTSC channels nor depend on the NTSC standard. The economics of television distribution dictate, however, that the enormous installed base of NTSC receivers will not be rendered obsolete until consumers have elected to substitute HDTV receivers on a widespread basis.

Time Inc. is committed to working with manufacturers to develop multi-standard television sets that would accommodate, in an efficient and non-duplicative manner, the "family" of HDTV standards that the marketplace is likely to develop if basic research is geared toward the optimal HDTV system for each television distribution medium.

Time Inc. thus urges the Commission to encourage an environment in which these far-ranging and important strategies for television improvements are likely to develop. The results could be of enormous significance for the American television viewer.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Brian Conboy", is written over a horizontal line.

Brian Conboy  
Vice President-Government Affairs  
Time Incorporated  
1050 Connecticut Avenue, N.W.  
Suite 850  
Washington, D.C. 20036-5334  
(202) 861-4000

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